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Subject: Area 2 SRI Comments Kalamazoo River OU5, WA 140-RSBD-059B, Contract No. EP-S5-06-01
Date: Friday, April 05, 2013 4:22:24 PM
Attachments: [Area_2_SRI_Comments_4-05-2013_Final.pdf](#)
[Area_2_SRI_Review_Comments_Transmittal.pdf](#)
[Area_2_SRI_Comments_4-05-2013_Final.docx](#)

Jim, attached are CH2M HILL's comments on the responsible party's Area 2 Supplemental Remedial Investigation report. I have included the comments in native WORD format for your use. If you have any questions regarding this submittal, please contact me at the number listed below.

Thanks JK

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GENERAL COMMENTS

Commenting Organization: EPA
General Comment: 1

Commenter: White

The hydrodynamic modeling results are informative and useful. However, Appendix M indicates that the model could not be calibrated because continuous historical measurements of river stage and velocity are not available. If hydrodynamic modeling will be used in other areas of the river for the SRI/FS, then field data should be collected to calibrate and verify the model.

Commenting Organization: EPA
General Comment: 2

Commenter: White/Saric

The SRI conclusions related to sediment and PCB transport are based primarily on data that were collected under low flow conditions. The water column PCB transport analysis in Section 6 is based on low-flow data, and the post-TCRA surface water data set does not include surface water samples collected under high flow conditions. The vast majority of the erosion pin survey data also were collected under low flow conditions. Sediment and PCB transport under high flow conditions should be considered more completely and the SRI conclusions should be revised accordingly. The estimations and conclusions based only upon low-flow conditions likely result in underestimating PCB loading to the river from bank erosion.

Commenting Organization: EPA
General Comment: 3

Commenter: Saric

The RI report does not discuss the impacts on sediment distribution or channel morphology if the Otsego City dam was removed. Given the ongoing discussions regarding removal of the Otsego City dam between EPA, MDNR and MDEQ the possibility of the dam being removed exists. Therefore, the remedial alternatives evaluated in the FS need to be consistent with a “dam out” scenario, and the discussion of future conditions in Area 2 in Section 9.5 of the SRI report should be expanded to more fully describe the potential impacts of dam removal.

Commenting Organization: EPA
General Comment: 4

Commenter: Keiser

The document should recognize that even though 14 of 16 samples with PCB concentrations over 50 ppm were in the subsurface, the PCBs may be subject to mobilization during high flow events.

Commenting Organization: EPA
General Comment: 5

Commenter: White

Although data tables with all pre-SRI and MDEQ long term monitoring data are provided in the report, the analytical data collected for the SRI data are not. Add an appendix with the SRI analytical data.

Commenting Organization: EPA

Commenter: Keiser

General Comment: 6

Include a short discussion of the impacts to mass and volume estimates due to low recovery using Macro-Core samplers during a portion of the field effort. In addition, using a predetermined core depth, as specified in the work plan, may have resulted in not fully characterizing the depth of contamination at various locations. These uncertainties should be discussed as they relate to the mass and volume estimates.

Commenting Organization: EPA
General Comment: 7

Commenter: Keiser

Total PCBs concentrations in surface water and some fish tissue were calculated using the sum of Aroclors or the sum congeners. Total Aroclor and total congener data are not comparable and should not be combined for evaluating trends in these media.

Commenting Organization: EPA
General Comment: 8

Commenter: Keiser

Discussions of SWAC methodology for the Area 1 FS report apply to the calculation of SWACs for Area 2. Revise SWAC calculations based on previous discussion and comments on the Area 1 FS and future work group discussions. If average PCB concentrations are reported for each sub-area, then the arithmetic mean should be used for all sub-areas instead of using a combination of geometric means, medians, and arithmetic means.

Commenting Organization: EPA
General Comment: 9

Commenter: Keiser

Fish trends were only evaluated on a wet weight basis. Discussions of fish trends for the Area 1 FS apply to the calculation of trends for Area 2. Add a discussion of fish trends as they relate to lipid concentrations and the uncertainty associated with both methods.

Commenting Organization: EPA
General Comment: 10

Commenter: Saric/Dillon

The recent publication by Manning et.al. 2013 indicates that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin like PCB congeners is more complex than the simple classification system of high, moderate and low sensitivity. The results of the current research suggest that there is no simple ratio of species sensitivity between the groups based on AhR structure and that the relative sensitivity is also affected by the mix of congeners, which suggest that sensitivity is partially site-specific.

EPA acknowledges that there continues to be uncertainty around this issue as the science develops further. The uncertainty raised by Manning et.al., 2013 needs to be acknowledged in the Area 2 SRI and TBERA and any discussion of unacceptable risk needs to reflect the potential for unacceptable risk to a sensitive avian species at the site to be greater than previously thought.

SPECIFIC COMMENTS

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 1

Page: ES-2

Commenter: White

Lines:

First bullet under “Overall” –delete the phrase “are low in all media” because this is a subjective assessment - revise to state that “PCB concentrations in Area 2 are declining in surface water, fish and sediments.” Revise the second half of this bullet (“river banks and sediment bed do not serve as important sources of PCBs to downstream Areas of the Site”) after sediment and PCB transport under high flow conditions has been more thoroughly evaluated.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 2

Page: ES-3

Commenter: White

Lines:

“The project in the former Plainwell Impoundment . . . controlled bank erosion sources of PCBs.” Add text to indicate that long-term monitoring and maintenance will be performed to verify that the source control measures remain effective.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 3

Page: ES-4

Commenter: White/Keiser

Lines:

First three bullets – as described in the specific comment on Section 5.2.6, the use of the term SWAC is misleading because the area associated with each PCB measurement is not taken into account. Additionally, discussions of SWAC methodology for the Area 1 FS report apply to the calculation of SWACs for Area 2. Revise SWAC calculations based on previous discussion and comments on the Area 1 FS.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 4

Page: ES-4

Commenter: White

Lines:

Fourth bullet – “This means that there are a limited number of locations within the Area 2 sediments have both higher PCB concentrations and the potential to be remobilized to downstream portions of the Site.” Revise this conclusion after sediment and PCB transport under high flow conditions has been more thoroughly characterized.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 5

Page: Table ES-1

Commenter: Keiser

Lines:

Table ES-1, add columns for mass per unit volume and SWACs for comparison.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 6

Page: ES-6

Commenter: White

Lines:

First bullet –update this bullet and modify Figure ES-6 after the PCB Aroclor data have been removed from the surface water trend analysis. Also add text to clarify that the surface water data used in the trend analysis represent low flow conditions.

Commenting Organization: EPA

Commenter: White

Section: Executive Summary

Page: ES-6

Lines:

Specific Comment: 7

Second bullet on page E-6 and first bullet on page E-7 –update these bullets after sediment and PCB transport under high flow conditions have been more thoroughly characterized.

Commenting Organization: EPA

Commenter: White

Section: Executive Summary

Page: ES-7

Lines:

Specific Comment: 8

Figure ES-7 – indicate the collection dates for the fish tissue data shown in this figure.

Commenting Organization: EPA

Commenter: Keiser

Section: Executive Summary

Page: ES-8

Lines:

Specific Comment: 9

First paragraph, Ceresco Reservoir should be included as an additional reference site.

Commenting Organization: EPA

Commenter: Keiser

Section: Executive Summary

Page: ES-8

Lines:

Specific Comment: 10

Conclusions regarding bank erosion should be revised after evaluating high flow conditions.

Commenting Organization: EPA

Commenter: Keiser

Section: Executive Summary

Page: ES-7

Lines:

Specific Comment: 11

Figure ES-7 – Provide a similar discussion of fish trends for lipid-normalized concentrations here and in the rest of the SRI.

Commenting Organization: EPA

Commenter: White

Section: Executive Summary

Page: ES-8, ES-9

Lines:

Specific Comment: 12

Update the conclusions after all other comments have been addressed.

Commenting Organization: EPA

Commenter: Keiser

Section: Executive Summary

Page: 1-4

Lines:

Specific Comment: 13

First paragraph last sentence, "... Area 2 is approximately 1.2 miles in length..." should this be 1.8 miles?

Commenting Organization: EPA
Section: Executive Summary
Specific Comment: 14

Commenter: Keiser
Lines:

Throughout the report, when discussing subareas, differentiate between the 2 geomorphic subareas and 8 physical subareas.

Commenting Organization: EPA
Section: 3.4
Page: 3-8
Lines:
Specific Comment: 15

Commenter: White

First paragraph – 22 cores were collected from previous locations for resampling. Please call out these 22 locations on Figure 3-4, perhaps by showing the sample location ID in bold font. Add text that describes the representativeness of these sample locations – do they span the range of PCB concentrations observed throughout Area 2?

Commenting Organization: EPA
Section: 4.1
Specific Comment: 16

Page: 4-1

Commenter: Saric
Lines:

The Douglas trust indicates residential land use. How will this property as illustrated in Appendix A be used for open space/recreational in the future? This property may require institutional controls such as deed restriction in the future. This issue should be discussed with the Trustee as the FS is developed.

Commenting Organization: EPA
Section: 4.3.2
Specific Comment: 17

Page: Table 4-3, page 4-6

Commenter: White
Lines:

Add a column with the estimated flow for each return period in Area 2.

Commenting Organization: EPA
Section: 4.5
Specific Comment: 18

Page: 4-10

Commenter: White
Lines:

Section 5.2.2 of the report subdivides Area 2 into eight subareas based on physical characteristics. Define these subareas immediately before Section 4.5 (Hydrodynamics) because the discussion of the model results refers to these specific subareas (e.g., upstream braided channels, southern braided section, northern cut-off braids).

Commenting Organization: EPA
Section: 4.5
Specific Comment: 19

Page: 4-11

Commenter: White
Lines:

Second paragraph – model results for river flows of 960 cfs, 3,300 cfs and 6,800 cfs are shown. Indicate the return period for each flow and the rationale for selecting these flows. Add the results for a 100-year return period because EPA's Contaminated Sediment Remediation

Guidance indicates that a 100-year flood should be evaluated to represent the potential effects of an extreme event.

Commenting Organization: EPA

Section: 4.5

Specific Comment: 20

Page: Figures 4-9g, h, i

Commenter: White

Lines:

The shear stress bins shown in the legends on these figures do not account for shear stresses of 1-2 N/m².

Commenting Organization: EPA

Section: 4.5

Specific Comment: 21

Page: 4-11

Commenter: White

Lines:

Third full paragraph – “ . . . [shear stresses] are relatively high at flows of 3,300 cfs or greater, indicating a state of dynamic equilibrium where significant further accumulation would not be expected.” The shear stresses by themselves are not an indicator of whether an area is in a state of dynamic equilibrium. Delete the phrase “a state of dynamic equilibrium where.”

Commenting Organization: EPA

Section: 4

Specific Comment: 22

Page: 4-11

Commenter: White

Lines:

Third full paragraph – “The sediment characteristics in this portion of Area 2 . . .” Please move this sentence and the rest of the paragraph to Section 4.7.1, where sediment types and their relationship to river flow and dam history are discussed. Expand the discussion in Section 4.7.1 to address the fate and transport of the material eroded from the former Plainwell Impoundment after the TCRA was completed in 2009.

Commenting Organization: EPA

Section: 4

Specific Comment: 23

Page: 4-15, Table 4-4

Commenter: White

Lines:

Move the row “Upstream Main Channel” below the row “Upstream Reach (including Main Channel and Braided Channels),” and indent the Upstream Main Channel and Upstream Braided Channel entries to clarify that these are sub-areas of the Upstream Reach.

Commenting Organization: EPA

Section: 4

Specific Comment: 24

Page: Figures 4-10 and 4-13

Commenter: White

Lines:

Figure 4-10 shows sediment thickness throughout Area 2, And Figure 4-13 shows “identified sediment deposit” areas. How is “sediment deposit” defined given that the sediment layer identified in Figure 4-10 is far more extensive? Revise the text and figure titles to more clearly differentiate what has been mapped.

Commenting Organization: EPA

Section: 4.7.3

Page: 4-17

Commenter: White

Lines:

Specific Comment: 25

Add a figure showing the specific cross sectional profiles discussed in this section (rather than directing the reader to Appendix D).

Commenting Organization: EPA

Section: 4.7.3

Page: 4-18

Commenter: White

Lines:

Specific Comment: 26

Second bullet – channels in the upstream braided area continue to evolve, with lateral movements of up to 34 feet and significant variations in bed elevations over the past 10 years. Discuss these observations in the context of the hydrodynamic model results – are the field observations consistent with the modeled shear stresses and documented sediment types?

Commenting Organization: EPA

Section: 4.8

Page: 4-21

Commenter: White

Lines:

Specific Comment: 27

Last paragraph –revise the following sentence as shown to be consistent with the information in Appendix I: “Erosion pins first established in November-December 2010 were resurveyed ~~during December 2010~~, in July-August 2011, and January 2012 . . .”

Commenting Organization: EPA

Section: 4.8

Page: 4-21

Commenter: White

Lines:

Specific Comment: 28

Move Figure I-2 to the main body of the report and summarize the flow conditions during the erosion pin survey.

Commenting Organization: EPA

Section: 4.8

Page: 4-22

Commenter: White

Lines:

Specific Comment: 29

Discuss the changes in the erosion pin profiles in the context of the hydrodynamic model results and known sediment types – are the areas and magnitudes of erosion and deposition consistent with the modeled velocities and shear stresses for the flow conditions that existed during the survey, particularly in the upper braided area?

Commenting Organization: EPA

Section: 5.2

Page: 5-5

Commenter: White

Lines:

Specific Comment: 30

Last sentence – “Use of the pre-SRI data also provides a conservative representation of present-day sediment conditions, due to the tendency of natural recovery processes to reduce exposure over time.” Delete this sentence – the representation is not necessarily conservative due to the impacts of the 2007-2009 TCRA in Area 1 (i.e., downstream migration of remobilized Area 1 sediments into Area 2).

Commenting Organization: EPA
Section: 5.2.2
Specific Comment: 31

Page: Figure 5.2-3

Commenter: White
Lines:

Amend the legend of this figure to include the description of each subarea (for example, Area A – Lower Main Stem). This comment also applies to the other Section 5 figures that only refer to Areas –add the descriptors to the Area designation.

Commenting Organization: EPA
Section: 5.2.2
Specific Comment: 32

Page: Figures 5.2-1a and 5.2-1b

Commenter: White
Lines:

The figure showing the core maximum PCB concentration should show the maximum concentration regardless of depth. Some sample locations show a higher surface sediment concentration (Figure 5.2-1a) than the core maximum (Figure 5.2-1b). If the core maximum only considers subsurface samples, then the figure title should be revised to indicate “Subsurface Core Maximum” (this comment also applies to Figure 5.3-1b). Distinguish between results that are detected at <0.5 mg/kg and between 0.5 – 1.0 mg/kg.

Commenting Organization: EPA
Section: 5.2.3
Specific Comment: 33

Page: 5-9, Figure 5.2-7

Commenter: White
Lines:

Discuss the relationship between PCB concentration and depth below the surface in each subarea. Figure 5.2-15 should be presented and discussed in this section.

Commenting Organization: EPA
Section: 5.2.5
Specific Comment: 34

Page: 5-13

Commenter: White
Lines:

Last sentence – delete the phrase “indicating that they consistently represent the same sediment strata among the events.” The definition of “sediment strata” is not clear in this context – all are surface sediment samples. The fact that the TOC concentrations are not significantly different over time indicates that the reductions in PCBs concentrations cannot be attributed to reductions in TOC content.

Commenting Organization: EPA
Section: 5.2.6
Specific Comment: 35

Page: 5-13

Commenter: White/Keiser
Lines:

The use of the term “Area-wide SWAC” in this section is misleading because the area associated with each PCB measurement is not taken into account. Discussions of SWAC methodology for the Area 1 FS report also affect the calculation of SWACs for Area 2. Revise the Area 2 SRI based on Area 1 discussion and comments.

Commenting Organization: EPA
Section: 5.3.3

Page: 5-23

Commenter: White
Lines:

Specific Comment: 36

Discuss the relationship between PCB concentration and depth below the surface in floodplain soils.

Commenting Organization: EPA

Commenter: White

Section: 5.4

Page: 5-31 and 5-32

Lines:

Specific Comment: 37

The bullets list the sources of surface water data. For each bullet, indicate whether the PCBs were quantified as total PCB Aroclors or total PCB congeners.

Commenting Organization: EPA

Commenter: White

Section: 5.4.1

Page: 5-34

Lines:

Specific Comment: 38

First paragraph – “Flows can affect PCB concentration by runoff contributions of PCBs and resuspension-related contributions of PCBs from the sediment bed . . .” Add bank erosion to the list of flow-related factors that influence PCB concentrations in surface water. Similarly, the first sentence in the second paragraph states that “PCB concentrations can show relationships with TSS concentrations as a result of resuspension and deposition . . .” – revise this phrase to indicate that PCB concentrations also can show relationships with TSS as a result of bank erosion. The third paragraph in this section states that “concentrations of PCBs within surface water are dependent on . . . the net transfer between sediments and the water column . . .” – revise this phrase to say the net transfer between sediments, bank soils, and the water column. The discussions that follow in this section should also consider the effects of bank erosion on surface water PCB concentrations.

Commenting Organization: EPA

Commenter: White

Section: 5.4.1

Page: 5-34

Lines:

Specific Comment: 39

“ . . . however, when TSS concentrations are dominated by loading and transport of clean sediments, correlation with PCB concentrations may not be present . . .” – This sentence is followed by a parenthetical list of sources – is this meant to be a list of sources of clean sediment?

Commenting Organization: EPA

Commenter: White

Section: 5.4.1

Page: 5-36, Figure 5.4-6 and 5.4-7

Lines:

Specific Comment: 40

On Figures 5.4-6 and 5.4-7, use the same scales for the x and y axes on the pre- and post-TCRA plots to facilitate direct comparisons. The first paragraph on page 5-37 indicates “ . . . a stronger relationship present at flows above approximately 2,000 cfs” for pre-TCRA conditions at the Farmer Street Bridge. Figure 5.4-6 indicates that the threshold for increasing PCB concentrations is closer to 3,000 cfs. The last paragraph on page 5-36 concludes “ . . . no consistent relationship with total PCB concentrations for the current (i.e., post-TCRA) conditions.” However, only one post-TCRA surface water sample was collected at a flow above 2,500 cfs, which is insufficient to

support this conclusion. A flow of 3,000 cfs appears to be a threshold for a shift from low-flow conditions to high flow conditions where erosion and resuspension of PCB-containing materials may occur.

Commenting Organization: EPA

Commenter: White

Section: 5.5.1

Page: 5-38

Lines:

Specific Comment: 41

Fish tissue PCB data overview - PCBs in fish tissue samples were quantified as total PCB Aroclors in some sample types and as total PCB congeners in others. Clarify in this section which tissue types were analyzed by which method, and confirm that Aroclor and congener data have not been pooled for analysis.

Commenting Organization: EPA

Commenter: White

Section: 6.2

Page: 6-2

Lines:

Specific Comment: 42

Third paragraph - include the backup for the sediment to surface water flux calculation, and provide the estimates for each subarea of Area 2 rather than an Area-wide estimate.

Commenting Organization: EPA

Commenter: White

Section: 6.2

Page: 6-2

Lines:

Specific Comment: 43

“ . . . Area 2 is not a depositional area . . . ” – insert the word “net” before depositional.

Commenting Organization: EPA

Commenter: White

Section: 6.2

Page: 6-2

Lines:

Specific Comment: 44

“External sources of PCBs to Area 2 are dominated by PCBs flowing in from upstream.” The relative contributions of PCBs from upstream sources and from bank erosion within Area 2 under both low and high flow conditions have not been established. Water column PCB transport as presented in Section 6.3 is based on low flow conditions only, and the erosion pin study within Area 2 was performed under predominately low flow conditions.

Commenting Organization: EPA

Commenter: White

Section: 6.3

Page: 6-3

Lines:

Specific Comment: 45

“Calculation of PCB loads . . . is based on measured surface water PCB concentrations and measured flow rates.” It appears that the data used in the evaluation solely represent low-flow conditions; clarify in the text whether or not this is the case.

Commenting Organization: EPA

Commenter: White

Section: 6.3

Page: 6-5

Lines:

Specific Comment: 46

The equation shown on page 6-5 and the footnotes to Tables 6-2 and 6-3 are for calculating the annual PCB load in kg/yr, but results are presented and discussed in terms of average daily loads. Revise the equation and the footnotes to indicate how the average daily load was calculated. In Table 6-4, add a column indicating whether the average daily PCB load is based on total PCB Aroclor or total PCB congener data.

Commenting Organization: EPA

Commenter: White

Section: 6.3.1

Page: 6-7

Lines:

Specific Comment: 47

"Prior to the TCRA, PCB loads Site-wide were higher, and increased in the downstream direction (Figure 6-2)." The trends are hard to discern in this figure –add trend lines for pre- and post-TCRA conditions based on the average daily PCB load at each location. This comment also applies to Figure 6-5 –add lines for each season showing the average PCB load at each location.

Commenting Organization: EPA

Commenter: White

Section: 6.3.1

Page: 6-8

Lines:

Specific Comment: 48

". . . bank erosion in Area 2 could potentially contribute approximately 1.8 kg/yr – well within the overall load gain of 3.2 kg/yr." This statement requires more explanation – it appears to be saying that the load gain observed in the surface water data can be largely attributed to bank erosion. Also note here that both the surface water and bank erosion estimates are based on low flow conditions.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-10

Lines:

Specific Comment: 49

Second paragraph – "Bank erosion data for Area 2 . . . show that bank erosion is not a major PCB loading process within Area 2." Both the water column and bank erosion loading estimates are based on low flow conditions – a more complete characterization of loading under high flow conditions must be presented before this conclusion can be made.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-10

Lines:

Specific Comment: 50

"The data indicate that the estimated annual load of PCBs from river banks in Area 2 is in the range of 1.7 to 1.9 kg/yr." Update this estimate after the comments on Appendix I have been addressed.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-10

Lines:

Specific Comment: 51

". . . the former Plainwell Impoundment TCRA successfully addressed erosion of PCB-containing river bank soils in the former Plainwell Impoundment . . ." Amend this statement to

indicate that long term monitoring and maintenance will be performed to ensure that the source control measures remain effective.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-10

Lines:

Specific Comment: 52

"These findings are supported by the water column PCB data . . . which indicate that sediment resuspension is not a major source of PCBs – flow and PCB concentration shows no clear correlations (Figure 5.4-6)." As previously noted, the post-TCRA surface water data set only includes one sample that was collected at a flow of greater than 2,500 cfs, so this conclusion cannot be supported by the post-TCRA data collected to date.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-11

Lines:

Specific Comment: 53

"Suspended load has been measured by sampling of TSS and PCB in the water column conducted in Area 2." The surface water data set represent suspended load transport primarily under low flow conditions – it does not represent high flow conditions where bed and bank erosion may be occurring.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-11

Lines:

Specific Comment: 54

Although the USGS sediment transport model (Syed et al., 2005) indicates that a flow of 1,950 cfs at Plainwell (which equates to a flow of about 2,110 cfs at Farmer Street) is the threshold between erosion and deposition, the pre-TCRA surface water data presented in Figure 5.4-6 indicates that the threshold for erosion is closer to 3,000 cfs.

Commenting Organization: EPA

Commenter: White

Section: 6.4.1

Page: 6-12

Lines:

Specific Comment: 55

Sediment type and transport – field observations (comparison between USGS and GP transects; erosion pin survey data) indicate that the upper braided section of Area 2 is a dynamic area with ongoing erosion, deposition, and channel migration. This is also an area with relatively higher PCB concentrations compared to other parts of Area 2, particularly in subsurface sediments and soils. The sediments in this area are predominately coarse-grained. The SRI should estimate critical shear stresses for the sediments in the upper braided area, which is a relatively straightforward exercise for non-cohesive sediments with a median grain size greater than 200 μm . These critical shear stresses should be compared to the bottom shear stresses calculated by the hydrodynamic model to characterize the flow conditions under which these sediments may be mobilized.

Commenting Organization: EPA

Commenter: White

Section: 6.5

Page: 6-13

Lines:

Specific Comment: 56

First paragraph, last sentence – “Mean and median floodplain soil surface PCB concentrations in Area 2 are low, at 1.9 mg/kg and 0.63 mg/kg, respectively.” Delete the phrase “low, at.”

Commenting Organization: EPA

Commenter: White

Section: 6.5

Page: 6-13

Lines:

Specific Comment: 57

“Shear stresses predicted under the highest modeled flow scenario (6,800 cfs) are quite low across much of the Area 2 floodplain, suggesting that the transport of PCBs out of the floodplain is not expected even under inundation conditions.” Shear stress information alone is not sufficient to determine whether or not the floodplain sediments and associated PCBs are likely to be mobilized under high flow conditions – the bottom shear stresses must be compared to the critical shear stresses of the floodplains soils. Provide more information to support the conclusion that PCB transport out of the floodplain is not expected even under high flow conditions.

Commenting Organization: EPA

Commenter: White

Section: 6.6.1

Page: 6-4

Lines:

Specific Comment: 58

PCB Aroclor and PCB congener data should not be pooled for trend analysis because the total PCB results by these two methods are not comparable. Report only the surface water temporal trends and surface water PCB half life based on data collected by MDEQ from 2001 through 2011. This comment also applies to the second bullet in Section 9.3.

Commenting Organization: EPA

Commenter: White

Section: 6.6.2

Page: 6-16

Lines:

Specific Comment: 59

The methods used for the fish tissue trend analysis should address discussions related to the fish tissue trend analysis for Area 1 FS.

Commenting Organization: EPA

Commenter: Dillon

Section: 8.2.4

Page: 8-14

Lines:

Specific Comment: 60

Include a discussion of the recent publication by Manning et.al. 2013 concerning that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin like PCB congeners and how that work affects the interpretation of the simple classification system of high, moderate and low sensitivity groups based on AhR structure.

Commenting Organization: EPA

Commenter: Dillon

Section: 8.2.5

Page: 8-17

Lines:

Specific Comment: 61

Modify the section titled “Assessment Endpoint 1: Sustainability of Local Insectivorous Bird Populations” to address TBERA specific Comments 73, 74 and 75.

Commenting Organization: EPA
Section: 8.2.5
Specific Comment: 62

Page: 8-18

Commenter: Dillon
Lines:

Modify the section titled “Assessment Endpoint 2: Sustainability of Local Vermivorous Bird Populations” to address TBERA specific Comments 73, 74 and 75.

Commenting Organization: EPA
Section: 8.2.5
Specific Comment: 63

Page: 8-19

Commenter: Dillon
Lines:

Modify the section titled “Assessment Endpoint 3: Sustainability of Local Insectivorous Mammal Populations” to address TBERA specific Comments 73, 74 and 75.

Commenting Organization: EPA
Section: 8.2.6
Specific Comment: 64

Page: 8-21

Commenter: Dillon
Lines:

Modify this section to be consistent with the revised TBERA Section 6.3.6.

Commenting Organization: EPA
Section: Table 8-5
Specific Comment: 65

Page: 8-21

Commenter: Dillon
Lines:

Modify Table 8-5 to address the uncertainties raised by Manning et.al. 2013.

Commenting Organization: EPA
Section: 9.1.1
Specific Comment: 66

Page: 9-2

Commenter: White
Lines:

The last paragraph on this page reports half lives for PCB concentrations in fish tissue. The uncertainty bounds associated with the estimates should also be reported.

Commenting Organization: EPA
Section: 9.1.3
Specific Comment: 67

Page: 9-5

Commenter: White
Lines:

Last sentence of first paragraph – “. . . however, no clear relationship between PCB concentration and flow is observed in the post-TCRA data set.” As previously noted, only one sample was collected above a flow of 2,500 cfs, and the threshold for resuspension appears to be between 2,500-3,000 cfs based on the pre-TCRA data set for the Farmer Street Bridge. Therefore, a relationship between PCB and flow would not be expected in the post-TCRA data set. Please clarify this point.

Commenting Organization: EPA

Commenter: White

Section: 9.1.3
Specific Comment: 68

Page: 9-5

Lines:

Second paragraph – this paragraph reports “relatively minor additional loading contribution to river PCB transport from the sediment and soil within Area 2.” The water column PCB transport estimates are based on low-flow data, and the erosion pin survey data were collected under largely low flow conditions (in fact, Section 3.2 in Appendix I indicates that “results may be useful on a relative basis but should be interpreted with caution on an absolute basis”). A more complete analysis of sediment and PCB transport under both low and high flow conditions is needed to support the conclusion that Area 2 is not an important source of PCBs to downstream areas. This comment also applies to the last sentence of the first main bullet on page 9-8 (“However, the Area 2-wide SWAC and surface water transport data indicate that these areas have minimal influence on PCB exposure and transport.”)

Commenting Organization: EPA
Section: 9.1.3
Specific Comment: 69

Page: 9-5

Commenter: White
Lines:

Third paragraph – “. . . there are some unremediated locations that may contribute PCBs downstream.” This paragraph lists specific unremediated locations (hot spots, off-channel areas, side channel at the Crown Vantage landfill, Portage Creek). In fact, PCBs are widely disseminated in channel sediments and floodplain soils throughout Area 1 (and Area 2), and any unremediated areas will continue to provide low levels of PCBs to fish. The specific locations identified are the areas of relatively higher PCB concentrations compared to the rest of Area 1. Revise this paragraph accordingly.

Commenting Organization: EPA
Section: 9.2
Specific Comment: 70

Page: 9-9

Commenter: White
Lines:

Second bullet – “The sediment deposits that have been identified outside of the cutoff braids (see Figure 4-13) present a more likely source of sediment available for transport, yet only a limited number of these deposits have been identified in Area 2.” Delete this sentence - the comparison of USGS and SRI transects measured 10 years apart and the erosion pin survey data have established that sediments and bank soils outside of the areas shown in Figure 4-13 are available for transport.

Commenting Organization: EPA
Section: 9.3
Specific Comment: 71

Page: 9-9

Commenter: White
Lines:

Report the uncertainty associated with the fish tissue half lives. Per previous comments, resolution of comments on the Area 1 FS may affect the methods used to estimate fish tissue concentration trends.

Commenting Organization: EPA
Section: Appendix I, 3.2.2
Specific Comment: 72

Page: 3-6

Commenter: White
Lines:

Provide the data used to calculate the PCB mass loading estimates from bank erosion. Additionally, report the estimates for each of the sub-areas where erosion pin surveys were performed in addition to the Area-wide estimate.

Commenting Organization: EPA
Section: Appendix K - Section 5.2 **Page:** 5-2
Specific Comment: 73

Commenter: Dillon
Lines:

Include a discussion of the recent publication by Manning et.al. 2013 concerning that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin like PCB congeners and how that work affects the interpretation of the simple classification system of high, moderate and low sensitivity groups based on AhR structure.

Commenting Organization: EPA
Section: Appendix K - Section 6.2.3.2.2 **Page:** 6-22
Specific Comment: 74

Commenter: Dillon
Lines: 6

Expand the discussion of the high and low earthworm BAF estimates to include the ratio between the RBCs for each receptor based on the high and low estimates provided in Table K6-10. Also include a summary of the change in percent home ranges that would have HQs greater than one for the high and low estimates. An additional table with these results should be included.

Commenting Organization: EPA
Section: Appendix K - Section 6.2.3.3 **Page:** 6-26
Specific Comment: 75

Commenter: Dillon
Lines: 19

Expand the discussion of the high and low egg-based BAF estimates to include the ratio between the RBCs for each receptor based on the high and low estimates provided in Table K6-13. Also include a summary of the change in percent home ranges that would have HQs greater than one for the high and low estimates. An additional table with these results should be included.

Commenting Organization: EPA
Section: Appendix K - Section 6.2.4.4 **Page:** 6-30
Specific Comment: 76

Commenter: Dillon
Lines:

Expand the uncertainty discussion to include the recent publication by Manning et.al. 2013 concerning that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin like PCB congeners and how that work affects the interpretation of the simple classification system of high, moderate and low sensitivity groups based on AhR structure. The uncertainty raised by Manning et.al., 2013 needs to be acknowledged and any discussion of potential unacceptable risk to a sensitive avian species at the site is greater than previously thought.

Commenting Organization: EPA
Section: Appendix K - Table K6-16 **Page:** 6-46

Commenter: Dillon
Lines:

Specific Comment: 77

Modify Table K6-16 to address the uncertainties raised by Manning et.al. 2013.

Commenting Organization: EPA

Section: Appendix K - Section 6.3.2 Page: 6-47

Specific Comment: 78

Commenter: Dillon

Lines:

Modify this section to address the additional analysis of uncertainties requested in comments 73, 74 and 75.

Commenting Organization: EPA

Section: Appendix K - Section 6.3.3 Page: 6-47

Specific Comment: 79

Commenter: Dillon

Lines:

Same as comment 78.

Commenting Organization: EPA

Section: Appendix K - Section 6.3.4 Page: 6-48

Specific Comment: 80

Commenter: Dillon

Lines:

Same as comment 78.

Commenting Organization: EPA

Section: Appendix K - Section 6.3.6 Page: 6-50

Specific Comment: 81

Commenter: Dillon

Lines:

Same as comment 78.

Commenting Organization: EPA

Section: Appendix K - Table K6-10 Page:

Specific Comment: 82

Commenter: Dillon

Lines:

Modify Table K6-10 to show the ratio between the RBCs for each receptor based on the high and low earthworm BAF estimates provided.

Commenting Organization: EPA

Section: Appendix K - Table K6-13 Page:

Specific Comment: 83

Commenter: Dillon

Lines:

Modify Table K6-13 to show the ratio between the RBCs for each receptor based on the high and low egg-based BAF estimates provided.

Commenting Organization: EPA

Section: Appendix M

Specific Comment: 84

Page: 4-2

Commenter: White

Lines:

Hydrodynamic model simulations were run for the base flow, bank full and 10-year flood flows. Add the simulation for a 100-year flood per EPA's Contaminated Sediment Remediation Guidance (2005).

Commenting Organization: EPA

Commenter: White

Section: Appendix M

Page: 7-1

Lines:

Specific Comment: 85

This section describes the relationship between bottom shear stress and the critical shear stress of the sediment bed. Expand this section to also discuss and consider bank erosion and deposition processes.

Commenting Organization: EPA

Commenter: White

Section: Appendix M

Page: 7-2

Lines:

Specific Comment: 86

"Reaches with high values of the applied critical shear stress indicate potential unstable or mobile bed sediment . . ." Areas with potentially unstable or mobile bed sediment are not necessarily limited to the areas with the highest shear stress values. Areas of potentially unstable sediment and bank soil should be identified by comparing the bottom shear stresses with the critical shear stresses of the sediment bed and banks. The erosion pin survey data and field observations indicate that bed sediment and bank soils are mobile to varying degrees throughout Area 2. A more in-depth analysis of sediment and sediment-associated PCB transport would help elucidate the significance of these processes.

Editorial Comments:

Page 4-6 - "The current dam sill elevation is approximately 699 feet NGVD29." Insert "Plainwell" before "dam."

Page 4-7, Section 4.4.1, Topography, second sentence - replace "679 feet" with "697 feet."

Page 4-12, first sentence, reference Rheaume et al. (2003) is not in the reference list.

Figures 4-9e and 4-9h are provided in two separate places - within the text, and in the separate section of figures.

References:

Manning G.E., L. J. Mundy, D. Crump, S. P. Jones, S. Chiu, J. Klein, A. Konstantinov, D. Potter, and S. W. Kennedy. 2013. Cytochrome P4501A induction in avian hepatocyte cultures exposed to polychlorinated biphenyls: Comparisons with AHR1-mediated reporter gene activity and *in ovo* toxicity. Toxicology and Applied Pharmacology 266 (2013) 38-47



CH2M HILL
135 S 84th Street
Suite 400
Milwaukee, WI 53214
Tel 414.276.2426

April 5, 2013

Mr. James Saric/Work Assignment Manager
U.S. Environmental Protection Agency Region 5 (SR-6J)
77 West Jackson Blvd.
Chicago, IL 60604

Subject: Kalamazoo River Area 1 Feasibility Study Review Comments
Kalamazoo River/Portage Creek OU-1
WA 140-RSBD-059B, Contract No. EP-S5-06-01

Dear: Mr. Saric

CH2M HILL has completed a review of the Kalamazoo River Area 2 Supplemental Remedial Investigation Report dated November 2012. The attached is a consolidated list of EPA and CH2M HILL comments. If you have any questions please contact me at (414) 847-0382.

Sincerely,

CH2M HILL

A handwritten signature in blue ink, appearing to read "J. Keiser".

Jeff Keiser
Project Manager

Enclosures

c: Rhonda Flynn, CO/USEPA Region 5 (w/o enclosure)
Ike Johnson, PM/CH2M HILL, Milwaukee
Paul Arps, DPM/CH2M HILL, Milwaukee
Theresa Rojas, QAM/CH2M HILL, Atlanta
Patty White, Reviewer/CH2M HILL, Boston
Frank Dillon, Reviewer/CH2M HILL, Detroit
Bill Andrae, Reviewer/CH2M HILL, Milwaukee
Cherrie Wilson, AA/CH2M HILL, Milwaukee

GENERAL COMMENTS

Commenting Organization: EPA
General Comment: 1

Commenter: White

The hydrodynamic modeling results are informative and useful. However, Appendix M indicates that the model could not be calibrated because continuous historical measurements of river stage and velocity are not available. If hydrodynamic modeling will be used in other areas of the river for the SRI/FS, then field data should be collected to calibrate and verify the model.

Commenting Organization: EPA
General Comment: 2

Commenter: White/Saric

The SRI conclusions related to sediment and PCB transport are based primarily on data that were collected under low flow conditions. The water column PCB transport analysis in Section 6 is based on low-flow data, and the post-TCRA surface water data set does not include surface water samples collected under high flow conditions. The vast majority of the erosion pin survey data also were collected under low flow conditions. Sediment and PCB transport under high flow conditions should be considered more completely and the SRI conclusions should be revised accordingly. The estimations and conclusions based only upon low-flow conditions likely result in underestimating PCB loading to the river from bank erosion.

Commenting Organization: EPA
General Comment: 3

Commenter: Saric

The RI report does not discuss the impacts on sediment distribution or channel morphology if the Otsego City dam was removed. Given the ongoing discussions regarding removal of the Otsego City dam between EPA, MDNR and MDEQ the possibility of the dam being removed exists. Therefore, the remedial alternatives evaluated in the FS need to be consistent with a “dam out” scenario, and the discussion of future conditions in Area 2 in Section 9.5 of the SRI report should be expanded to more fully describe the potential impacts of dam removal.

Commenting Organization: EPA
General Comment: 4

Commenter: Keiser

The document should recognize that even though 14 of 16 samples with PCB concentrations over 50 ppm were in the subsurface, the PCBs may be subject to mobilization during high flow events.

Commenting Organization: EPA
General Comment: 5

Commenter: White

Although data tables with all pre-SRI and MDEQ long term monitoring data are provided in the report, the analytical data collected for the SRI data are not. Add an appendix with the SRI analytical data.

Commenting Organization: EPA

Commenter: Keiser

General Comment: 6

Include a short discussion of the impacts to mass and volume estimates due to low recovery using Macro-Core samplers during a portion of the field effort. In addition, using a predetermined core depth, as specified in the work plan, may have resulted in not fully characterizing the depth of contamination at various locations. These uncertainties should be discussed as they relate to the mass and volume estimates.

Commenting Organization: EPA
General Comment: 7

Commenter: Keiser

Total PCBs concentrations in surface water and some fish tissue were calculated using the sum of Aroclors or the sum congeners. Total Aroclor and total congener data are not comparable and should not be combined for evaluating trends in these media.

Commenting Organization: EPA
General Comment: 8

Commenter: Keiser

Discussions of SWAC methodology for the Area 1 FS report apply to the calculation of SWACs for Area 2. Revise SWAC calculations based on previous discussion and comments on the Area 1 FS and future work group discussions. If average PCB concentrations are reported for each sub-area, then the arithmetic mean should be used for all sub-areas instead of using a combination of geometric means, medians, and arithmetic means.

Commenting Organization: EPA
General Comment: 9

Commenter: Keiser

Fish trends were only evaluated on a wet weight basis. Discussions of fish trends for the Area 1 FS apply to the calculation of trends for Area 2. Add a discussion of fish trends as they relate to lipid concentrations and the uncertainty associated with both methods.

Commenting Organization: EPA
General Comment: 10

Commenter: Saric/Dillon

The recent publication by Manning et.al. 2013 indicates that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin like PCB congeners is more complex than the simple classification system of high, moderate and low sensitivity. The results of the current research suggest that there is no simple ratio of species sensitivity between the groups based on AhR structure and that the relative sensitivity is also affected by the mix of congeners, which suggest that sensitivity is partially site-specific.

EPA acknowledges that there continues to be uncertainty around this issue as the science develops further. The uncertainty raised by Manning et.al., 2013 needs to be acknowledged in the Area 2 SRI and TBERA and any discussion of unacceptable risk needs to reflect the potential for unacceptable risk to a sensitive avian species at the site to be greater than previously thought.

SPECIFIC COMMENTS

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 1

Page: ES-2

Commenter: White

Lines:

First bullet under “Overall” –delete the phrase “are low in all media” because this is a subjective assessment - revise to state that “PCB concentrations in Area 2 are declining in surface water, fish and sediments.” Revise the second half of this bullet (“river banks and sediment bed do not serve as important sources of PCBs to downstream Areas of the Site”) after sediment and PCB transport under high flow conditions has been more thoroughly evaluated.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 2

Page: ES-3

Commenter: White

Lines:

“The project in the former Plainwell Impoundment . . . controlled bank erosion sources of PCBs.” Add text to indicate that long-term monitoring and maintenance will be performed to verify that the source control measures remain effective.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 3

Page: ES-4

Commenter: White/Keiser

Lines:

First three bullets – as described in the specific comment on Section 5.2.6, the use of the term SWAC is misleading because the area associated with each PCB measurement is not taken into account. Additionally, discussions of SWAC methodology for the Area 1 FS report apply to the calculation of SWACs for Area 2. Revise SWAC calculations based on previous discussion and comments on the Area 1 FS.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 4

Page: ES-4

Commenter: White

Lines:

Fourth bullet – “This means that there are a limited number of locations within the Area 2 sediments have both higher PCB concentrations and the potential to be remobilized to downstream portions of the Site.” Revise this conclusion after sediment and PCB transport under high flow conditions has been more thoroughly characterized.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 5

Page: Table ES-1

Commenter: Keiser

Lines:

Table ES-1, add columns for mass per unit volume and SWACs for comparison.

Commenting Organization: EPA

Section: Executive Summary

Specific Comment: 6

Page: ES-6

Commenter: White

Lines:

First bullet –update this bullet and modify Figure ES-6 after the PCB Aroclor data have been removed from the surface water trend analysis. Also add text to clarify that the surface water data used in the trend analysis represent low flow conditions.

Commenting Organization: EPA

Commenter: White

Section: Executive Summary

Page: ES-6

Lines:

Specific Comment: 7

Second bullet on page E-6 and first bullet on page E-7 –update these bullets after sediment and PCB transport under high flow conditions have been more thoroughly characterized.

Commenting Organization: EPA

Commenter: White

Section: Executive Summary

Page: ES-7

Lines:

Specific Comment: 8

Figure ES-7 – indicate the collection dates for the fish tissue data shown in this figure.

Commenting Organization: EPA

Commenter: Keiser

Section: Executive Summary

Page: ES-8

Lines:

Specific Comment: 9

First paragraph, Ceresco Reservoir should be included as an additional reference site.

Commenting Organization: EPA

Commenter: Keiser

Section: Executive Summary

Page: ES-8

Lines:

Specific Comment: 10

Conclusions regarding bank erosion should be revised after evaluating high flow conditions.

Commenting Organization: EPA

Commenter: Keiser

Section: Executive Summary

Page: ES-7

Lines:

Specific Comment: 11

Figure ES-7 – Provide a similar discussion of fish trends for lipid-normalized concentrations here and in the rest of the SRI.

Commenting Organization: EPA

Commenter: White

Section: Executive Summary

Page: ES-8, ES-9

Lines:

Specific Comment: 12

Update the conclusions after all other comments have been addressed.

Commenting Organization: EPA

Commenter: Keiser

Section: Executive Summary

Page: 1-4

Lines:

Specific Comment: 13

First paragraph last sentence, "... Area 2 is approximately 1.2 miles in length..." should this be 1.8 miles?

Commenting Organization: EPA
Section: Executive Summary
Specific Comment: 14

Commenter: Keiser
Lines:

Throughout the report, when discussing subareas, differentiate between the 2 geomorphic subareas and 8 physical subareas.

Commenting Organization: EPA
Section: 3.4
Page: 3-8
Lines:
Specific Comment: 15

Commenter: White

First paragraph – 22 cores were collected from previous locations for resampling. Please call out these 22 locations on Figure 3-4, perhaps by showing the sample location ID in bold font. Add text that describes the representativeness of these sample locations – do they span the range of PCB concentrations observed throughout Area 2?

Commenting Organization: EPA
Section: 4.1
Specific Comment: 16

Page: 4-1

Commenter: Saric
Lines:

The Douglas trust indicates residential land use. How will this property as illustrated in Appendix A be used for open space/recreational in the future? This property may require institutional controls such as deed restriction in the future. This issue should be discussed with the Trustee as the FS is developed.

Commenting Organization: EPA
Section: 4.3.2
Specific Comment: 17

Page: Table 4-3, page 4-6

Commenter: White
Lines:

Add a column with the estimated flow for each return period in Area 2.

Commenting Organization: EPA
Section: 4.5
Specific Comment: 18

Page: 4-10

Commenter: White
Lines:

Section 5.2.2 of the report subdivides Area 2 into eight subareas based on physical characteristics. Define these subareas immediately before Section 4.5 (Hydrodynamics) because the discussion of the model results refers to these specific subareas (e.g., upstream braided channels, southern braided section, northern cut-off braids).

Commenting Organization: EPA
Section: 4.5
Specific Comment: 19

Page: 4-11

Commenter: White
Lines:

Second paragraph – model results for river flows of 960 cfs, 3,300 cfs and 6,800 cfs are shown. Indicate the return period for each flow and the rationale for selecting these flows. Add the results for a 100-year return period because EPA's Contaminated Sediment Remediation

Guidance indicates that a 100-year flood should be evaluated to represent the potential effects of an extreme event.

Commenting Organization: EPA

Section: 4.5

Specific Comment: 20

Page: Figures 4-9g, h, i

Commenter: White

Lines:

The shear stress bins shown in the legends on these figures do not account for shear stresses of 1-2 N/m².

Commenting Organization: EPA

Section: 4.5

Specific Comment: 21

Page: 4-11

Commenter: White

Lines:

Third full paragraph – “ . . . [shear stresses] are relatively high at flows of 3,300 cfs or greater, indicating a state of dynamic equilibrium where significant further accumulation would not be expected.” The shear stresses by themselves are not an indicator of whether an area is in a state of dynamic equilibrium. Delete the phrase “a state of dynamic equilibrium where.”

Commenting Organization: EPA

Section: 4

Specific Comment: 22

Page: 4-11

Commenter: White

Lines:

Third full paragraph – “The sediment characteristics in this portion of Area 2 . . .” Please move this sentence and the rest of the paragraph to Section 4.7.1, where sediment types and their relationship to river flow and dam history are discussed. Expand the discussion in Section 4.7.1 to address the fate and transport of the material eroded from the former Plainwell Impoundment after the TCRA was completed in 2009.

Commenting Organization: EPA

Section: 4

Specific Comment: 23

Page: 4-15, Table 4-4

Commenter: White

Lines:

Move the row “Upstream Main Channel” below the row “Upstream Reach (including Main Channel and Braided Channels),” and indent the Upstream Main Channel and Upstream Braided Channel entries to clarify that these are sub-areas of the Upstream Reach.

Commenting Organization: EPA

Section: 4

Specific Comment: 24

Page: Figures 4-10 and 4-13

Commenter: White

Lines:

Figure 4-10 shows sediment thickness throughout Area 2, And Figure 4-13 shows “identified sediment deposit” areas. How is “sediment deposit” defined given that the sediment layer identified in Figure 4-10 is far more extensive? Revise the text and figure titles to more clearly differentiate what has been mapped.

Commenting Organization: EPA

Section: 4.7.3

Page: 4-17

Commenter: White

Lines:

Specific Comment: 25

Add a figure showing the specific cross sectional profiles discussed in this section (rather than directing the reader to Appendix D).

Commenting Organization: EPA

Section: 4.7.3

Page: 4-18

Commenter: White

Lines:

Specific Comment: 26

Second bullet – channels in the upstream braided area continue to evolve, with lateral movements of up to 34 feet and significant variations in bed elevations over the past 10 years. Discuss these observations in the context of the hydrodynamic model results – are the field observations consistent with the modeled shear stresses and documented sediment types?

Commenting Organization: EPA

Section: 4.8

Page: 4-21

Commenter: White

Lines:

Specific Comment: 27

Last paragraph –revise the following sentence as shown to be consistent with the information in Appendix I: “Erosion pins first established in November-December 2010 were resurveyed ~~during December 2010~~, in July-August 2011, and January 2012 . . .”

Commenting Organization: EPA

Section: 4.8

Page: 4-21

Commenter: White

Lines:

Specific Comment: 28

Move Figure I-2 to the main body of the report and summarize the flow conditions during the erosion pin survey.

Commenting Organization: EPA

Section: 4.8

Page: 4-22

Commenter: White

Lines:

Specific Comment: 29

Discuss the changes in the erosion pin profiles in the context of the hydrodynamic model results and known sediment types – are the areas and magnitudes of erosion and deposition consistent with the modeled velocities and shear stresses for the flow conditions that existed during the survey, particularly in the upper braided area?

Commenting Organization: EPA

Section: 5.2

Page: 5-5

Commenter: White

Lines:

Specific Comment: 30

Last sentence – “Use of the pre-SRI data also provides a conservative representation of present-day sediment conditions, due to the tendency of natural recovery processes to reduce exposure over time.” Delete this sentence – the representation is not necessarily conservative due to the impacts of the 2007-2009 TCRA in Area 1 (i.e., downstream migration of remobilized Area 1 sediments into Area 2).

Commenting Organization: EPA
Section: 5.2.2
Specific Comment: 31

Page: Figure 5.2-3

Commenter: White
Lines:

Amend the legend of this figure to include the description of each subarea (for example, Area A – Lower Main Stem). This comment also applies to the other Section 5 figures that only refer to Areas –add the descriptors to the Area designation.

Commenting Organization: EPA
Section: 5.2.2
Specific Comment: 32

Page: Figures 5.2-1a and 5.2-1b

Commenter: White
Lines:

The figure showing the core maximum PCB concentration should show the maximum concentration regardless of depth. Some sample locations show a higher surface sediment concentration (Figure 5.2-1a) than the core maximum (Figure 5.2-1b). If the core maximum only considers subsurface samples, then the figure title should be revised to indicate “Subsurface Core Maximum” (this comment also applies to Figure 5.3-1b). Distinguish between results that are detected at <0.5 mg/kg and between 0.5 – 1.0 mg/kg.

Commenting Organization: EPA
Section: 5.2.3
Specific Comment: 33

Page: 5-9, Figure 5.2-7

Commenter: White
Lines:

Discuss the relationship between PCB concentration and depth below the surface in each subarea. Figure 5.2-15 should be presented and discussed in this section.

Commenting Organization: EPA
Section: 5.2.5
Specific Comment: 34

Page: 5-13

Commenter: White
Lines:

Last sentence – delete the phrase “indicating that they consistently represent the same sediment strata among the events.” The definition of “sediment strata” is not clear in this context – all are surface sediment samples. The fact that the TOC concentrations are not significantly different over time indicates that the reductions in PCBs concentrations cannot be attributed to reductions in TOC content.

Commenting Organization: EPA
Section: 5.2.6
Specific Comment: 35

Page: 5-13

Commenter: White/Keiser
Lines:

The use of the term “Area-wide SWAC” in this section is misleading because the area associated with each PCB measurement is not taken into account. Discussions of SWAC methodology for the Area 1 FS report also affect the calculation of SWACs for Area 2. Revise the Area 2 SRI based on Area 1 discussion and comments.

Commenting Organization: EPA
Section: 5.3.3

Page: 5-23

Commenter: White
Lines:

Specific Comment: 36

Discuss the relationship between PCB concentration and depth below the surface in floodplain soils.

Commenting Organization: EPA

Section: 5.4

Specific Comment: 37

Page: 5-31 and 5-32

Commenter: White

Lines:

The bullets list the sources of surface water data. For each bullet, indicate whether the PCBs were quantified as total PCB Aroclors or total PCB congeners.

Commenting Organization: EPA

Section: 5.4.1

Specific Comment: 38

Page: 5-34

Commenter: White

Lines:

First paragraph – “Flows can affect PCB concentration by runoff contributions of PCBs and resuspension-related contributions of PCBs from the sediment bed . . .” Add bank erosion to the list of flow-related factors that influence PCB concentrations in surface water. Similarly, the first sentence in the second paragraph states that “PCB concentrations can show relationships with TSS concentrations as a result of resuspension and deposition . . .” – revise this phrase to indicate that PCB concentrations also can show relationships with TSS as a result of bank erosion. The third paragraph in this section states that “concentrations of PCBs within surface water are dependent on . . . the net transfer between sediments and the water column . . .” – revise this phrase to say the net transfer between sediments, bank soils, and the water column. The discussions that follow in this section should also consider the effects of bank erosion on surface water PCB concentrations.

Commenting Organization: EPA

Section: 5.4.1

Specific Comment: 39

Page: 5-34

Commenter: White

Lines:

“ . . . however, when TSS concentrations are dominated by loading and transport of clean sediments, correlation with PCB concentrations may not be present . . .” – This sentence is followed by a parenthetical list of sources – is this meant to be a list of sources of clean sediment?

Commenting Organization: EPA

Section: 5.4.1

Specific Comment: 40

Page: 5-36, Figure 5.4-6 and 5.4-7

Commenter: White

Lines:

On Figures 5.4-6 and 5.4-7, use the same scales for the x and y axes on the pre- and post-TCRA plots to facilitate direct comparisons. The first paragraph on page 5-37 indicates “ . . . a stronger relationship present at flows above approximately 2,000 cfs” for pre-TCRA conditions at the Farmer Street Bridge. Figure 5.4-6 indicates that the threshold for increasing PCB concentrations is closer to 3,000 cfs. The last paragraph on page 5-36 concludes “ . . . no consistent relationship with total PCB concentrations for the current (i.e., post-TCRA) conditions.” However, only one post-TCRA surface water sample was collected at a flow above 2,500 cfs, which is insufficient to

support this conclusion. A flow of 3,000 cfs appears to be a threshold for a shift from low-flow conditions to high flow conditions where erosion and resuspension of PCB-containing materials may occur.

Commenting Organization: EPA

Commenter: White

Section: 5.5.1

Page: 5-38

Lines:

Specific Comment: 41

Fish tissue PCB data overview - PCBs in fish tissue samples were quantified as total PCB Aroclors in some sample types and as total PCB congeners in others. Clarify in this section which tissue types were analyzed by which method, and confirm that Aroclor and congener data have not been pooled for analysis.

Commenting Organization: EPA

Commenter: White

Section: 6.2

Page: 6-2

Lines:

Specific Comment: 42

Third paragraph - include the backup for the sediment to surface water flux calculation, and provide the estimates for each subarea of Area 2 rather than an Area-wide estimate.

Commenting Organization: EPA

Commenter: White

Section: 6.2

Page: 6-2

Lines:

Specific Comment: 43

“ . . . Area 2 is not a depositional area . . . ” – insert the word “net” before depositional.

Commenting Organization: EPA

Commenter: White

Section: 6.2

Page: 6-2

Lines:

Specific Comment: 44

“External sources of PCBs to Area 2 are dominated by PCBs flowing in from upstream.” The relative contributions of PCBs from upstream sources and from bank erosion within Area 2 under both low and high flow conditions have not been established. Water column PCB transport as presented in Section 6.3 is based on low flow conditions only, and the erosion pin study within Area 2 was performed under predominately low flow conditions.

Commenting Organization: EPA

Commenter: White

Section: 6.3

Page: 6-3

Lines:

Specific Comment: 45

“Calculation of PCB loads . . . is based on measured surface water PCB concentrations and measured flow rates.” It appears that the data used in the evaluation solely represent low-flow conditions; clarify in the text whether or not this is the case.

Commenting Organization: EPA

Commenter: White

Section: 6.3

Page: 6-5

Lines:

Specific Comment: 46

The equation shown on page 6-5 and the footnotes to Tables 6-2 and 6-3 are for calculating the annual PCB load in kg/yr, but results are presented and discussed in terms of average daily loads. Revise the equation and the footnotes to indicate how the average daily load was calculated. In Table 6-4, add a column indicating whether the average daily PCB load is based on total PCB Aroclor or total PCB congener data.

Commenting Organization: EPA

Commenter: White

Section: 6.3.1

Page: 6-7

Lines:

Specific Comment: 47

"Prior to the TCRA, PCB loads Site-wide were higher, and increased in the downstream direction (Figure 6-2)." The trends are hard to discern in this figure –add trend lines for pre- and post-TCRA conditions based on the average daily PCB load at each location. This comment also applies to Figure 6-5 –add lines for each season showing the average PCB load at each location.

Commenting Organization: EPA

Commenter: White

Section: 6.3.1

Page: 6-8

Lines:

Specific Comment: 48

"... bank erosion in Area 2 could potentially contribute approximately 1.8 kg/yr – well within the overall load gain of 3.2 kg/yr." This statement requires more explanation – it appears to be saying that the load gain observed in the surface water data can be largely attributed to bank erosion. Also note here that both the surface water and bank erosion estimates are based on low flow conditions.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-10

Lines:

Specific Comment: 49

Second paragraph – "Bank erosion data for Area 2 ... show that bank erosion is not a major PCB loading process within Area 2." Both the water column and bank erosion loading estimates are based on low flow conditions – a more complete characterization of loading under high flow conditions must be presented before this conclusion can be made.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-10

Lines:

Specific Comment: 50

"The data indicate that the estimated annual load of PCBs from river banks in Area 2 is in the range of 1.7 to 1.9 kg/yr." Update this estimate after the comments on Appendix I have been addressed.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-10

Lines:

Specific Comment: 51

"... the former Plainwell Impoundment TCRA successfully addressed erosion of PCB-containing river bank soils in the former Plainwell Impoundment ... "Amend this statement to

indicate that long term monitoring and maintenance will be performed to ensure that the source control measures remain effective.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-10

Lines:

Specific Comment: 52

"These findings are supported by the water column PCB data . . . which indicate that sediment resuspension is not a major source of PCBs – flow and PCB concentration shows no clear correlations (Figure 5.4-6)." As previously noted, the post-TCRA surface water data set only includes one sample that was collected at a flow of greater than 2,500 cfs, so this conclusion cannot be supported by the post-TCRA data collected to date.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-11

Lines:

Specific Comment: 53

"Suspended load has been measured by sampling of TSS and PCB in the water column conducted in Area 2." The surface water data set represent suspended load transport primarily under low flow conditions – it does not represent high flow conditions where bed and bank erosion may be occurring.

Commenting Organization: EPA

Commenter: White

Section: 6.4

Page: 6-11

Lines:

Specific Comment: 54

Although the USGS sediment transport model (Syed et al., 2005) indicates that a flow of 1,950 cfs at Plainwell (which equates to a flow of about 2,110 cfs at Farmer Street) is the threshold between erosion and deposition, the pre-TCRA surface water data presented in Figure 5.4-6 indicates that the threshold for erosion is closer to 3,000 cfs.

Commenting Organization: EPA

Commenter: White

Section: 6.4.1

Page: 6-12

Lines:

Specific Comment: 55

Sediment type and transport – field observations (comparison between USGS and GP transects; erosion pin survey data) indicate that the upper braided section of Area 2 is a dynamic area with ongoing erosion, deposition, and channel migration. This is also an area with relatively higher PCB concentrations compared to other parts of Area 2, particularly in subsurface sediments and soils. The sediments in this area are predominately coarse-grained. The SRI should estimate critical shear stresses for the sediments in the upper braided area, which is a relatively straightforward exercise for non-cohesive sediments with a median grain size greater than 200 μm . These critical shear stresses should be compared to the bottom shear stresses calculated by the hydrodynamic model to characterize the flow conditions under which these sediments may be mobilized.

Commenting Organization: EPA

Commenter: White

Section: 6.5

Page: 6-13

Lines:

Specific Comment: 56

First paragraph, last sentence – “Mean and median floodplain soil surface PCB concentrations in Area 2 are low, at 1.9 mg/kg and 0.63 mg/kg, respectively.” Delete the phrase “low, at.”

Commenting Organization: EPA

Commenter: White

Section: 6.5

Page: 6-13

Lines:

Specific Comment: 57

“Shear stresses predicted under the highest modeled flow scenario (6,800 cfs) are quite low across much of the Area 2 floodplain, suggesting that the transport of PCBs out of the floodplain is not expected even under inundation conditions.” Shear stress information alone is not sufficient to determine whether or not the floodplain sediments and associated PCBs are likely to be mobilized under high flow conditions – the bottom shear stresses must be compared to the critical shear stresses of the floodplains soils. Provide more information to support the conclusion that PCB transport out of the floodplain is not expected even under high flow conditions.

Commenting Organization: EPA

Commenter: White

Section: 6.6.1

Page: 6-4

Lines:

Specific Comment: 58

PCB Aroclor and PCB congener data should not be pooled for trend analysis because the total PCB results by these two methods are not comparable. Report only the surface water temporal trends and surface water PCB half life based on data collected by MDEQ from 2001 through 2011. This comment also applies to the second bullet in Section 9.3.

Commenting Organization: EPA

Commenter: White

Section: 6.6.2

Page: 6-16

Lines:

Specific Comment: 59

The methods used for the fish tissue trend analysis should address discussions related to the fish tissue trend analysis for Area 1 FS.

Commenting Organization: EPA

Commenter: Dillon

Section: 8.2.4

Page: 8-14

Lines:

Specific Comment: 60

Include a discussion of the recent publication by Manning et.al. 2013 concerning that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin like PCB congeners and how that work affects the interpretation of the simple classification system of high, moderate and low sensitivity groups based on AhR structure.

Commenting Organization: EPA

Commenter: Dillon

Section: 8.2.5

Page: 8-17

Lines:

Specific Comment: 61

Modify the section titled “Assessment Endpoint 1: Sustainability of Local Insectivorous Bird Populations” to address TBERA specific Comments 73, 74 and 75.

Commenting Organization: EPA
Section: 8.2.5
Specific Comment: 62

Page: 8-18

Commenter: Dillon
Lines:

Modify the section titled “Assessment Endpoint 2: Sustainability of Local Vermivorous Bird Populations” to address TBERA specific Comments 73, 74 and 75.

Commenting Organization: EPA
Section: 8.2.5
Specific Comment: 63

Page: 8-19

Commenter: Dillon
Lines:

Modify the section titled “Assessment Endpoint 3: Sustainability of Local Insectivorous Mammal Populations” to address TBERA specific Comments 73, 74 and 75.

Commenting Organization: EPA
Section: 8.2.6
Specific Comment: 64

Page: 8-21

Commenter: Dillon
Lines:

Modify this section to be consistent with the revised TBERA Section 6.3.6.

Commenting Organization: EPA
Section: Table 8-5
Specific Comment: 65

Page: 8-21

Commenter: Dillon
Lines:

Modify Table 8-5 to address the uncertainties raised by Manning et.al. 2013.

Commenting Organization: EPA
Section: 9.1.1
Specific Comment: 66

Page: 9-2

Commenter: White
Lines:

The last paragraph on this page reports half lives for PCB concentrations in fish tissue. The uncertainty bounds associated with the estimates should also be reported.

Commenting Organization: EPA
Section: 9.1.3
Specific Comment: 67

Page: 9-5

Commenter: White
Lines:

Last sentence of first paragraph – “. . . however, no clear relationship between PCB concentration and flow is observed in the post-TCRA data set.” As previously noted, only one sample was collected above a flow of 2,500 cfs, and the threshold for resuspension appears to be between 2,500-3,000 cfs based on the pre-TCRA data set for the Farmer Street Bridge. Therefore, a relationship between PCB and flow would not be expected in the post-TCRA data set. Please clarify this point.

Commenting Organization: EPA

Commenter: White

Section: 9.1.3
Specific Comment: 68

Page: 9-5

Lines:

Second paragraph – this paragraph reports “relatively minor additional loading contribution to river PCB transport from the sediment and soil within Area 2.” The water column PCB transport estimates are based on low-flow data, and the erosion pin survey data were collected under largely low flow conditions (in fact, Section 3.2 in Appendix I indicates that “results may be useful on a relative basis but should be interpreted with caution on an absolute basis”). A more complete analysis of sediment and PCB transport under both low and high flow conditions is needed to support the conclusion that Area 2 is not an important source of PCBs to downstream areas. This comment also applies to the last sentence of the first main bullet on page 9-8 (“However, the Area 2-wide SWAC and surface water transport data indicate that these areas have minimal influence on PCB exposure and transport.”)

Commenting Organization: EPA
Section: 9.1.3
Specific Comment: 69

Page: 9-5

Commenter: White
Lines:

Third paragraph – “. . . there are some unremediated locations that may contribute PCBs downstream.” This paragraph lists specific unremediated locations (hot spots, off-channel areas, side channel at the Crown Vantage landfill, Portage Creek). In fact, PCBs are widely disseminated in channel sediments and floodplain soils throughout Area 1 (and Area 2), and any unremediated areas will continue to provide low levels of PCBs to fish. The specific locations identified are the areas of relatively higher PCB concentrations compared to the rest of Area 1. Revise this paragraph accordingly.

Commenting Organization: EPA
Section: 9.2
Specific Comment: 70

Page: 9-9

Commenter: White
Lines:

Second bullet – “The sediment deposits that have been identified outside of the cutoff braids (see Figure 4-13) present a more likely source of sediment available for transport, yet only a limited number of these deposits have been identified in Area 2.” Delete this sentence - the comparison of USGS and SRI transects measured 10 years apart and the erosion pin survey data have established that sediments and bank soils outside of the areas shown in Figure 4-13 are available for transport.

Commenting Organization: EPA
Section: 9.3
Specific Comment: 71

Page: 9-9

Commenter: White
Lines:

Report the uncertainty associated with the fish tissue half lives. Per previous comments, resolution of comments on the Area 1 FS may affect the methods used to estimate fish tissue concentration trends.

Commenting Organization: EPA
Section: Appendix I, 3.2.2
Specific Comment: 72

Page: 3-6

Commenter: White
Lines:

Provide the data used to calculate the PCB mass loading estimates from bank erosion. Additionally, report the estimates for each of the sub-areas where erosion pin surveys were performed in addition to the Area-wide estimate.

Commenting Organization: EPA
Section: Appendix K - Section 5.2 **Page:** 5-2
Specific Comment: 73

Commenter: Dillon
Lines:

Include a discussion of the recent publication by Manning et.al. 2013 concerning that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin like PCB congeners and how that work affects the interpretation of the simple classification system of high, moderate and low sensitivity groups based on AhR structure.

Commenting Organization: EPA
Section: Appendix K - Section 6.2.3.2.2 **Page:** 6-22
Specific Comment: 74

Commenter: Dillon
Lines: 6

Expand the discussion of the high and low earthworm BAF estimates to include the ratio between the RBCs for each receptor based on the high and low estimates provided in Table K6-10. Also include a summary of the change in percent home ranges that would have HQs greater than one for the high and low estimates. An additional table with these results should be included.

Commenting Organization: EPA
Section: Appendix K - Section 6.2.3.3 **Page:** 6-26
Specific Comment: 75

Commenter: Dillon
Lines: 19

Expand the discussion of the high and low egg-based BAF estimates to include the ratio between the RBCs for each receptor based on the high and low estimates provided in Table K6-13. Also include a summary of the change in percent home ranges that would have HQs greater than one for the high and low estimates. An additional table with these results should be included.

Commenting Organization: EPA
Section: Appendix K - Section 6.2.4.4 **Page:** 6-30
Specific Comment: 76

Commenter: Dillon
Lines:

Expand the uncertainty discussion to include the recent publication by Manning et.al. 2013 concerning that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin like PCB congeners and how that work affects the interpretation of the simple classification system of high, moderate and low sensitivity groups based on AhR structure. The uncertainty raised by Manning et.al., 2013 needs to be acknowledged and any discussion of potential unacceptable risk to a sensitive avian species at the site is greater than previously thought.

Commenting Organization: EPA
Section: Appendix K - Table K6-16 **Page:** 6-46

Commenter: Dillon
Lines:

Specific Comment: 77

Modify Table K6-16 to address the uncertainties raised by Manning et.al. 2013.

Commenting Organization: EPA

Section: Appendix K - Section 6.3.2 Page: 6-47

Specific Comment: 78

Commenter: Dillon

Lines:

Modify this section to address the additional analysis of uncertainties requested in comments 73, 74 and 75.

Commenting Organization: EPA

Section: Appendix K - Section 6.3.3 Page: 6-47

Specific Comment: 79

Commenter: Dillon

Lines:

Same as comment 78.

Commenting Organization: EPA

Section: Appendix K - Section 6.3.4 Page: 6-48

Specific Comment: 80

Commenter: Dillon

Lines:

Same as comment 78.

Commenting Organization: EPA

Section: Appendix K - Section 6.3.6 Page: 6-50

Specific Comment: 81

Commenter: Dillon

Lines:

Same as comment 78.

Commenting Organization: EPA

Section: Appendix K - Table K6-10 Page:

Specific Comment: 82

Commenter: Dillon

Lines:

Modify Table K6-10 to show the ratio between the RBCs for each receptor based on the high and low earthworm BAF estimates provided.

Commenting Organization: EPA

Section: Appendix K - Table K6-13 Page:

Specific Comment: 83

Commenter: Dillon

Lines:

Modify Table K6-13 to show the ratio between the RBCs for each receptor based on the high and low egg-based BAF estimates provided.

Commenting Organization: EPA

Section: Appendix M

Specific Comment: 84

Page: 4-2

Commenter: White

Lines:

Hydrodynamic model simulations were run for the base flow, bank full and 10-year flood flows. Add the simulation for a 100-year flood per EPA's Contaminated Sediment Remediation Guidance (2005).

Commenting Organization: EPA

Commenter: White

Section: Appendix M

Page: 7-1

Lines:

Specific Comment: 85

This section describes the relationship between bottom shear stress and the critical shear stress of the sediment bed. Expand this section to also discuss and consider bank erosion and deposition processes.

Commenting Organization: EPA

Commenter: White

Section: Appendix M

Page: 7-2

Lines:

Specific Comment: 86

"Reaches with high values of the applied critical shear stress indicate potential unstable or mobile bed sediment . . ." Areas with potentially unstable or mobile bed sediment are not necessarily limited to the areas with the highest shear stress values. Areas of potentially unstable sediment and bank soil should be identified by comparing the bottom shear stresses with the critical shear stresses of the sediment bed and banks. The erosion pin survey data and field observations indicate that bed sediment and bank soils are mobile to varying degrees throughout Area 2. A more in-depth analysis of sediment and sediment-associated PCB transport would help elucidate the significance of these processes.

Editorial Comments:

Page 4-6 - "The current dam sill elevation is approximately 699 feet NGVD29." Insert "Plainwell" before "dam."

Page 4-7, Section 4.4.1, Topography, second sentence - replace "679 feet" with "697 feet."

Page 4-12, first sentence, reference Rheaume et al. (2003) is not in the reference list.

Figures 4-9e and 4-9h are provided in two separate places - within the text, and in the separate section of figures.

References:

Manning G.E., L. J. Mundy, D. Crump, S. P. Jones, S. Chiu, J. Klein, A. Konstantinov, D. Potter, and S. W. Kennedy. 2013. Cytochrome P4501A induction in avian hepatocyte cultures exposed to polychlorinated biphenyls: Comparisons with AHR1-mediated reporter gene activity and *in ovo* toxicity. Toxicology and Applied Pharmacology 266 (2013) 38-47